

Rural Energy – Matching Needs and Resources

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INTRODUCTION

It was perhaps a foreseeable irony that as the energy industries in the developing world move increasingly closer to the “free market” model, there is a real threat that the gap between those that have access to reliable energy supplies and the unserved in rural areas will widen. Much has happened in the world of the “IPP’s”, dominated by large fossil fueled projects, each of which has presented a series of challenges before reaching financial closure. Enormous amounts of resources, time and money, have been poured into restructuring an industry that we know performed poorly in the past. But have these resources been well used in the broader interests of those whose countries are now the recipients of this restructuring? We can’t have our time over again, nor should we seek to return to the past, but what are we learning and are we more able to address the shortcomings of those systems that we are so eager to replace?

Few of you here need any introduction to the issues facing rural communities around the world as they seek to provide themselves with even the most basic energy resources on a sustainable basis. So where can they turn for support as the world moves into the market driven age, setting aside many of the social responsibilities that government owned agencies at least acknowledged, even if they achieved little in addressing them?

Recognizing the importance of energy as both a tool of development and as a crucial determinant of environmental quality the question was raised, *where can small amounts of money be placed at critical times to create a substantial social and environmental benefit?* Through trial and error, the Rockefeller Foundation and E&Co, an independent organization created by the Foundation in 1994, have come to realize a few simple but nearly universal truths. Most good ideas die for lack of small amounts of money to make them real enough for later stage investors and many ideas to promote environmentally sound, affordable energy services are ideas that involve creating business-oriented initiatives.

E&Co Activities

It is on this basis that E&Co has developed its strategy for intervention in the renewable energy market – the investment of modest amounts (from \$50,000 or less, to US\$ 250,000 in any one case) into what are perceived to be economically, socially and environmentally sustainable *energy*

enterprises. To many this will seem an anathema – particularly to those still captured by an ongoing search for subsidies and government leadership, or who question the concept that smaller scale rural energy developments could ever be considered sustainable, commercial ventures. True, this is far from universal, but there are a growing number of successful projects lending increasing credence to this approach.

To date E&Co has invested some US\$ 4.7 million in 36 enterprises in 21 developing countries. One key lesson that has been learnt through these investments is that money is not always the problem. It is the link between money and the good ideas that is often missing in this sector. The need to promote and strengthen private enterprises is therefore a key element to overcome these issues. This is the gap E&Co is trying to fill.

There are a number of projects in which E&Co has played a part that can be provided as examples, many of which may well be known to a number of you:

- Lotus Energy is a small photovoltaic company that has for several years served an increasingly important role in the PV market in Nepal. In a move to address the cost of imported balance of systems items, it established a small but well regarded local manufacturing capability. Its market was small but the company had built up an excellent network and strong working relationship with the Agricultural Bank of Nepal, through which subsidized loans have been available for system purchase. The company needed additional working capital to expand but local sources were unwilling to lend against the limited assets that Lotus had available. E&Co took a small equity position (investing \$150,000) in the company allowing them to bulk purchase imported components, expand their staff to 60 and further develop their distribution network – no mean feat when many clients can be a two week trek from the end of the nearest access road. Today Lotus has installed over 1000 systems, has a competent servicing and backup program and is strongly positioned to participate in a Danish project that will provide funds for some 30,000 PV systems throughout Nepal. Importantly, this program is designed to progressively reduce the subsidy offered for the purchase of the PV systems (over a five year period). Lotus acknowledges that they have a responsibility to find ways to offset this reduction through cost savings on the units that they supply.

In addition to this involvement with Lotus, E&Co has had a long-term involvement in the PV industry with groups like SELCO, Soluz, NOOR and others. We see this as an entry point into the business of rural electrification that is not capital intensive, can engage a number of individuals at various tiers within the industry and, well structured, can grow to have a significant impact. Others directly involved with some of these activities will speak later during this meeting.

- In Bolivia, the installation of a 7 MW hydroelectric plant has provided not only a much needed electricity source, but improved both the supply and quality of fresh water to the city of Cochabamba. At a time when regulatory issues were threatening progress on the project, E&Co provided a \$250,000 loan ensuring that others funders would

honor their commitment to the project, which is now due for commissioning late this year.

- In 1996, the Cooperativa Eléctrica Riberalta (CER) of Bolivia requested a \$100,000 loan from E&Co to complete its 1 MW biomass generation project, fueled by Brazil nut husks and residual scrap wood from local sawmills. Construction was underway but substantial increases in equipment shipping costs and additional equipment left insufficient funds to complete it. The loan from E&Co, and the support of the National Rural Electric Cooperative Association (NRECA) from the United States, provided the necessary financing for the project to move forward to where it is now fully operational.
- In Viet Nam, Oxfam Quebec has worked for several years with a national agricultural association, Vacvina, introducing a simple but effective biogas system for farmers. Each system costs around US\$ 50. With the success of the 200-300 demonstration systems, the challenge was how to move the program to a stage where it could have significant impact. Vacvina has a national membership of over 250,000 and hence an extensive network within the farming community. Following a six month period, in which fundamental business planning issues were addressed with the organization, E&Co provided a \$60,000 loan for working capital. Within the first three months of operations over 400 systems have been sold into 11 provinces throughout the north of Viet Nam. A national promotional campaign is planned and Vacvina is targeting annual sales of 3,000 systems. The systems provide an effective method of treatment of animal wastes and, with a minimal number of animals, provide sufficient gas for daily cooking needs. This removes the need for firewood, relieving women from the burden of collection, and provides an effluent stream that can be safely used for irrigation and aquaculture.
- Génesis Empresarial, a micro-credit NGO from Guatemala, received a \$100,000 loan from E&Co in 1996 to expand its credit program and introduce electric energy in rural areas. Without this loan, for which E&Co offered long-term support (five year repayment) and below-market rates, the fund could not expand because the transaction costs of lending for rural off-grid PV, wind and hydro projects are too high in Guatemala. Génesis, with 20,000 clients, was thus able to charge a lower than commercial interest rate and to extend the repayment period from the traditional maximum of two. In addition, the micro-lender became familiar with renewable energy technologies and began using its training system to build human capacity for renewables at the local level. The renewable energy systems are currently being successfully delivered to rural villages and Génesis is being repaid as agreed.
- In China, E&Co has provided support to the Xiangtan joint venture being established by Bergey Windpower, allowing the local manufacture of small-scale wind turbines. Bergey's strong market reputation and the significant wind market in China, and elsewhere in Asia, make this an important opportunity. Even before manufacture has begun, other potential market expansion has been identified. The Chinese government

clearly supports the use of wind power and it is significant that the World Bank's PV program in Mongolia has been expanded to include wind generation, a change needed to match the electricity demand level already reached by many rural consumers.

- From a recent trip through Viet Nam and other parts of Asia it has become apparent that there is a potential market for *good quality* micro-hydro turbines, along the lines of the "Chinese" turbines so prevalent in Viet Nam. The challenge is to identify and underwrite an entity that can bring this potential to market.

These are just a few examples which I hope demonstrate an approach that we believe offers concrete solutions to what many still see as a daunting and insurmountable obstacles to effective rural energy supplies. We could debate at some length the penetration that these projects have in reaching the most needy— we are convinced however that without these initiatives it is unlikely that any sustainable support system could be established for the least fortunate individuals within these societies.

Funding Initiatives

Over the past three years, there has been significant activity targeted to the establishment of dedicated institutions for renewable energy and energy efficiency finance. The following examples are funding mechanisms in which E&Co has been actively involved. While we are excited about the prospects of these mechanisms, we are also very cautious as they must succeed. A failure to move forward would greatly harm the attraction of private capital to renewable energy and energy efficiency enterprises.

- REEF: the Renewable Energy and Energy Efficiency Fund an investment fund managed by a private sector team, to finance renewable energy and energy efficiency projects that is currently fund raising. It will have three components: equity funds, debt funds and a concessionary finance window with which it will finance on-grid renewable energy in the 5 to 50 MW range as well as smaller off-grid renewable energy projects and energy efficiency undertakings. The REEF's lead sponsor and investor is the International Finance Corporation. The Global Environment Facility has agreed to provide a grant of up to \$30 million in proportion to the size of the equity pool that is expected to be of around \$100 million. With a matching debt facility from the IFC, the fund is expected to grown to \$180 to \$230 million.
- The Solar Development Corporation: the SDC is to be established as a stand-alone, eventually commercial company providing business development and financing for solar PV operations, particularly in rural areas. Now in development by the International Finance Corporation, the World Bank and a number of United States Foundations, the SDC is expected to open for business in 1999 and its financing will be in the pre-commercial and parallel to commercial stages. The target initial capitalization for the pilot period is \$50 million of which approximately \$15 million will be for business development and \$35 million for direct finance. The GEF has been asked to provide between \$10-15 million to support the market and business development component.

- Energy Capital Holding Company: ECHCO provides integrated (engineering, insurance and financing services) project financing for medium size –10 MW to 250MW- environmentally and commercially sound energy projects in Latin America and the Caribbean. With 19 senior in-country managers in 15 LAC countries, it enables energy projects to enjoy the funding advantages of international banking, non-banking and capital markets previously available only to large projects.

There are a number of other institutions with interest in renewable energy financing, including Environmental Enterprises Assistance Fund (EEAF), Triodos Bank in the Netherlands and bilateral and multilateral programs which play an important role in their own sectors of interest. A range of international banks have now participated in the financing of geothermal, wind and hydro-electric power production, but typically with a focus on larger scale projects.

Where Now?

The challenge now is no longer to demonstrate what works but to achieve scale impact on the one hand and build the distribution channels of product and finance that will electrify the 400 million or so households world-wide that today require affordable and reliable basic energy services.

I would refer you to a paper delivered by Phil LaRocco of E&Co at a recent meeting in Quito. In this he outlines an approach that would allow us to take our best experience and apply it to a realistic rural electrification goal. He asks, “*what would it mean if we were to set a goal to electrify 20% of rural households in three Latin American countries such as Peru, Ecuador and Bolivia?*” Building on a model of the “MacSolar” concept, that formed the basis for the original approach to the Solar Development Corporation, he outlines a mechanism that could establish a US \$350 million initiative to provide electrification to 20% of the rural market addressing the needs of about 550,000 family units. The approach envisions a franchise type operation, needing some 120 “entrepreneurs”, whereby there is a core regional support group that provides finance, standardized product and training and assistance to allow individual entrepreneurs, or sales and distribution points, to grow and service a base of energy end-users. It is feasible that a national operation would develop once a number of regional enterprises are in existence.

With financing available to the "bundled" regional and national operations, the local entrepreneurs can access finance at reasonable rates. A franchise approach allows profit to be earned at each of the tiers of operations, with the customer benefiting through the energy services they now receive.

Conclusion

Four years of experience in financing small renewable energy projects around the world have taught E&Co that one of the major challenges is still the need to envision energy as a development component that must be closely interconnected with private sector initiatives. The linkage between energy, development and finance must clearly be understood.

There are a growing number of success stories that can provide models for future development in rural electrification. As these successes gain wider recognition there will be an increasing demand for sustainable sources of finance. The market recognizes this need but to build the renewable

finance industry will require initiatives that drive *order of magnitude changes* in the business of renewables. These in turn will require a focus on the link between money and the good ideas that is often missing in this sector and the promotion and strengthening of *private enterprises*, a key element in the successes to date.